

WHAT IS CLAIMED IS:

1. An isolated nucleic acid comprising at least one adenine base, at least one guanine base, at least one cytosine base, and at least one thymine or uracil base, wherein said isolated nucleic acid is at least 12 bases in length, and hybridizes to the sense or antisense strand of a second nucleic acid under hybridization conditions, said second nucleic acid having a sequence as set forth in SEQ ID NO:1, 2, 5, 6, 7, 8, 9, 10, 13, 14, 15, 16, 17, 20, 22, 23, 24, 25, 28, 29, 33, 34, 35, 37, 39, 40, 41, 42, 43, 44, 47, 49, 50, 51, 52, 53, 54, 55, 56, or 57.
2. The isolated nucleic acid of claim 1, wherein said hybridization conditions are moderately stringent hybridization conditions.
3. The isolated nucleic acid of claim 1, wherein said hybridization conditions are highly stringent hybridization conditions.
4. An isolated nucleic acid, wherein said isolated nucleic acid comprises a nucleic acid sequence that encodes an amino acid sequence at least five amino acids in length, said amino acid sequence comprising at least three different amino acid residues, and being identical to a contiguous portion of sequence set forth in SEQ ID NO:11, 21, 30, 36, 38, or 48.
5. An isolated nucleic acid comprising a nucleic acid sequence at least 60 percent identical to the sequence set forth in SEQ ID NO:1, 2, 5, 6, 7, 8, 9, 10, 13, 14, 15, 16, 17, 20, 22, 23, 24, 25, 28, 29, 33, 34, 35, 37, 39, 40, 41, 42, 43, 44, 47, 49, 50, 51, 52, 53, 54, 55, 56, or 57.
6. An isolated nucleic acid, wherein said isolated nucleic acid comprises a nucleic acid sequence that encodes an amino acid sequence at least 60 percent identical to the sequence set forth in SEQ ID NO:11, 21, 30, 36, 38, or 48.

1 7. An isolated nucleic acid comprising a nucleic acid sequence as set forth in SEQ ID NO:1,
2 2, 5, 6, 7, 8, 9, 10, 13, 14, 15, 16, 17, 20, 22, 23, 24, 25, 28, 29, 33, 34, 35, 37, 39, 40, 41, 42, 43,
3 44, 47, 49, 50, 51, 52, 53, 54, 55, 56, or 57.

1 8. A substantially pure polypeptide comprising an amino acid sequence encoded by a
2 nucleic acid of claim 1.

1 9. A substantially pure polypeptide comprising an amino acid sequence as set forth in SEQ
2 ID NO:11, 21, 30, 36, 38, or 48.

1 10. A substantially pure polypeptide comprising an amino acid sequence at least 60 percent
2 identical to the sequence set forth in SEQ ID NO:11, 21, 30, 36, 38, or 48.

1 11. A substantially pure polypeptide comprising an amino acid sequence at least five amino
2 acids in length, said amino acid sequence comprising at least three different amino acid residues,
3 and being identical to a contiguous stretch of sequence set forth in SEQ ID NO:11, 21, 30, 36,
4 38, or 48.

1 12. A host cell containing an isolated nucleic acid of claim 1.

1 13. The host cell of claim 12, wherein said host cell is a eukaryotic cell.

1 14. An antibody having specific binding affinity for an amino acid sequence encoded by a
2 nucleic acid of claim 1.

1 15. The antibody of claim 14, wherein said antibody is monoclonal.

1 16. The antibody of claim 14, wherein said antibody is polyclonal.

1 17. A cDNA library comprising a plurality of clones, wherein each clone comprises a cDNA
2 insert and wherein at least about 15 percent of said clones comprise cDNA derived from
3 immediate early genes.

1 18. The cDNA library of claim 17, wherein at least about 20 percent of said clones comprise
2 cDNA derived from immediate early genes.

1 19. The cDNA library of claim 17, wherein at least about 25 percent of said clones comprise
2 cDNA derived from immediate early genes.

1 20. The cDNA library of claim 17, wherein said immediate early genes are immediate early
2 genes responsive to a maximal electroconvulsive seizure.

1 21. The cDNA library of claim 17, wherein said cDNA library is a subtracted cDNA library.

1 22. The cDNA library of claim 21, wherein said subtracted cDNA library is IEG-Reg cDNA
2 library.

1 23. The cDNA library of claim 21, wherein said subtracted cDNA library is IEG-Lg cDNA
2 library.

1 24. An isolated nucleic acid derived from a cDNA library, wherein said cDNA library
2 comprises a plurality of clones, wherein each clone comprises a cDNA insert and wherein at
3 least about 15 percent of said clones comprise cDNA derived from immediate early genes.

1 25. The isolated nucleic acid of claim 24, wherein said isolated nucleic acid comprises a
2 nucleic acid sequence of an immediate early gene.

1 26. A method of obtaining immediate early gene nucleic acid, said method comprising:
2 a) providing a cDNA library, said cDNA library comprising a plurality of clones,
3 wherein each clone comprises a cDNA insert and wherein at least about 15 percent of said clones
4 comprise cDNA derived from immediate early genes;
5 b) contacting at least a portion of said cDNA library with a probe, said probe containing
6 at least one nucleic acid having a nucleic acid sequence derived from an immediate early gene;
7 and
8 c) selecting a member of said plurality of clones based on the hybridization of said at
9 least one nucleic acid to said member under hybridization conditions, said member comprising
10 said immediate early gene nucleic acid.

27. A method of treating an animal having a deficiency in a neuron's immediate early gene responsiveness to a stimulus, said method comprising administering a nucleic acid of claim 1 to said animal such that the effect of said deficiency is minimized.

28. The method of claim 27, wherein said deficiency comprises a reduced level of expression of an immediate early gene.

29. The method of claim 27, wherein said stimulus influences learning or memory.

1 30. The method of claim 29, wherein said stimulus comprises a maximal electroconvulsive
2 seizure.

1 31. A method of treating an animal having a deficiency in a neuron's immediate early gene responsiveness to a stimulus, said method comprising administering a therapeutically effective amount of a substantially pure polypeptide of claim 8 to said animal such that the effect of said deficiency is minimized.

1 32. A method of treating an animal having a deficiency in a neuron's immediate early gene
2 responsiveness to a stimulus, said method comprising administering an effective amount of cells
3 to said animal such that the effect of said deficiency is minimized, said cells containing a nucleic
4 acid of claim 1.

1 33. A method of treating an animal having a deficiency in a neuron's immediate early gene
2 responsiveness to a stimulus, said method comprising administering a therapeutically effective of
3 antibodies to said animal such that the effect of said deficiency is minimized, said antibodies
4 having specific binding affinity for an amino acid sequence encoded by a nucleic acid of claim 1.

1 34. The method of claim 33, wherein said deficiency comprises an elevated level of
2 expression of an immediate early gene.
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5 35. A method of identifying a compound that modulates immediate early gene expression,
6 said method comprising:

- 7 a) contacting a test compound with an immediate early gene nucleic acid; and
- 8 b) determining whether said test compound effects the expression of said immediate early
9 gene nucleic acid, wherein the presence of an effect indicates that said test compound is said
10 compound.

1 36. The method of claim 35, wherein said immediate early gene nucleic acid comprises a
2 nucleic acid sequence as set forth in SEQ ID NO:1, 2, 5, 6, 7, 8, 9, 10, 13, 14, 15, 16, 17, 20, 22,
3 23, 24, 25, 28, 29, 33, 34, 35, 37, 39, 40, 41, 42, 43, 44, 47, 49, 50, 51, 52, 53, 54, 55, 56, or 57.

1 37. The method of claim 35, wherein said effect is a reduction in the expression of said
2 immediate early gene nucleic acid.

1 38. The method of claim 35, wherein said effect is an increase in the expression of said
2 immediate early gene nucleic acid.

1 39. A method of identifying a compound that modulates immediate early gene polypeptide
2 activity, said method comprising:

- 3 a) contacting a test compound with an immediate early gene polypeptide; and
- 4 b) determining whether said test compound effects the activity of said immediate early
- 5 gene polypeptide, wherein the presence of an effect indicates that said test compound is said
- 6 compound.

1 40. The method of claim 39, wherein said immediate early gene polypeptide comprises an
2 amino acid sequence encoded by a nucleic acid of claim 1.

1 41. The method of claim 39, wherein said immediate early gene polypeptide comprises an
2 amino acid sequence as set forth in SEQ ID NO:11, 21, 30, 36, 38, or 48.

1 42. The method of claim 39, wherein said effect is a reduction in the activity of said
2 immediate early gene polypeptide.

1 43. The method of claim 39, wherein said effect is an increase in the activity of said
2 immediate early gene polypeptide.

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